Fossil Identification
Field Guide

Patrick Nurre
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By Patrick Nurre
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I. Learning the Fossil Terms

Often, fossil collecting and identification can be frustrating because geologists use technical words in the scientific languages of Greek and Latin. This alone is enough to discourage anyone. One thing I have never understood is that our culture now considers Latin and Greek to be dead languages, most likely because we don’t use these languages in our everyday speech. But if you want to be a scientist, you must learn some Latin and Greek. It will not only help you understand scientific terms, but will even improve your English, too. So, it is well worth the effort to learn a few terms that will help you identify and enjoy collecting fossils.

Following is a short list of terms and words that will prove helpful in learning how to identify your fossils.

- **Biostratigraphy** – the branch of geology concerned with the separation and differentiation of rock units by means of the study of the fossils they contain. This is how secular geologists organize the rock layers. For example, all rock layers that have a particular kind of ammonite (AM-mo-nite) would all be the same age. But this ignores the Flood and assumes that the rock layers signify great ages of time. In contrast to this term, the Biblical geologist would refer to the study of the rock layers as Flood stratigraphy – the layers of rocks, and the Genesis Flood laid down the fossils in them, rapidly and consecutively. The prefix *bios-* is from the Greek, and has to do with *life*.

- **Calcite** – a common mineral consisting of the elements calcium, oxygen, and carbon (calcium carbonate) and is the most abundant mineral in sedimentary rocks.
Concretion – from two Latin words, con, meaning together, and crescere, meaning to grow. Concretions are found in sedimentary strata. Although no one has witnessed concretions forming today, the fact that they are found in sedimentary layers (rocks laid down by water and mud), may hold a clue to their formation – the Flood of Genesis. Concretions are usually a sedimentary material such as clay, sandstone or limestone that has collected around a nucleus of some kind. Often the nuclei of these concretions consist of fossils of all types. Some people ask what the difference is between a concretion and a nodule. Although they may look similar, a nodule can be any material and is often volcanic in origin. A nodule is a lump, knot, or mass of aggregate mineral originally found in contrasting host stratum. An example of a nodule is a thunder egg found in hardened volcanic rhyolite ash or lava.

Coprolite – meaning dung stone; the petrified/fossilized remains of poop!

Disarticulation (disarticulated) – means a state of separation. The condition of being broken up and scattered. Dinosaur bones are most often found as disarticulated or separated bits and pieces of bone, usually in sandstone, siltstone, limestone, and other sedimentary rock. Disarticulation is a key to the Genesis Flood. The catastrophic nature of a global flood would have torn up most dinosaurs as they were initially overcome by the raging Genesis Flood, then buried under tons of sediments, and then torn up again as the Flood waters receded off of the face of the earth. This is why we rarely find complete dinosaur skeletons. Except for most marine/fresh water invertebrates and many vertebrates, most land vertebrate and plant fossils are preserved in the rocks as broken up pieces of bone. Why is this? No one knows for sure, but a
good guess is that most marine invertebrates and vertebrates that have been preserved as fossils were probably buried immediately with the breaking up of the fountains of the great deep. The last creatures to be buried in the Flood were most likely vertebrate land creatures that floated and then either gradually broke up as they began to decay or were eaten by surviving marine creatures. Later as the mountains rose and the valleys sank down according to Psalm 104:5-9, vertebrate land creatures that had been buried in the flood sediments were again broken up and transported across vast land masses. The word articulate is from the Latin articulateus, having to do with dividing into joints.

- **Extant** - means that something is still living. It is from the Latin extant, meaning to be visible or prominent or existing.

- **Extinct** – extinct means that a creature is considered to no longer be in existence. The use of this term should be with caution, however. There are many examples of living things that have been declared to be extinct, only to show up somewhere in the world! Two familiar examples are the coelacanth (*SEE-la-canth*) fish, thought to have gone extinct 65 million years ago and then showed up alive off the coast of Madagascar in the 1930s and the Gingko plant which was once thought to be extinct, only to be discovered alive and well in China. It is from the Latin extinct which means extinguished.

- **The Fossil Record** – the sum of the fossils that have been collected.

- **Fossilization** – the process of turning a once living thing into a fossil. The word fossil comes from a Latin word, fossilis, and means obtained by digging. This process is not fully understood today. The main reason is that not many dead things become fossils. They decay quickly, and that’s the end of it! I don’t know of....
VI. Identifying the Invertebrate Sea Fossils, Part One

There are so many invertebrate sea fossils that we could cover, so we are going to take two chapters to cover them.

What is an invertebrate? An invertebrate is an animal without a backbone. There are several fossil animals that meet this criterion that are quite common in the fossil record:

- Trilobites
- Corals
- Crinoids
- Sea Urchins
- Bryozoa

One of the most amazing facts that paleontologists discovered as early as the 1840s was that what they called the lowest layer in the fossil-bearing strata contained billions of well-developed and well-diversified fossil animals. Life seems to have exploded on to the scene of life with no evolutionary history or ancestry. Most of the fossil animals mentioned above were part of what has been called, The Cambrian Explosion. This event remains today one of the most prolific unsolved mysteries of evolution. Darwin was extremely bothered by this phenomenon and considered it to be one of the main objections that could be made against his ideas of evolution by natural selection.

Even though paleontologists had considered these animals to be primitive in the evolutionary scheme of things, these animals were later shown to be highly developed creatures but showed no evolutionary history! Some of these animals have gone extinct but some still thrive in water environments today.
Where to find these fossil sea animals?
Since these were marine animals, you can find these creatures in almost any area that sedimentary rock exists, especially in limestone and in shale.

Limestone is generally a light-colored rock. But it can be darker in color too. Look for fossils. Also, if you have some muriatic acid, if after placing a drop on the rock it fizzes, you have found limestone.

(Left) Limestone with fossils; (right) Limestone without fossils

(Left) Limestone with fossils; (right) Limestone without fossils
Another form of limestone is called **coquina**. Coquina is a mass of cemented fossil shells and is quite common on the coasts of Florida and California.

Coquina – one containing fossil shells (Florida), the other a fossil vertebrate bone (Texas)

**Shale** is a fine-grained sedimentary rock usually exhibiting layers and can contain an abundance of fossils.

Samples of shale from Montana, California, and Nebraska
Sandstone can also contain fossils. Sandstone is a coarse-grained, sedimentary rock, made up primarily of tiny quartz crystals. Some fossils you may find in sandstone could include mud cracks and ichno fossils.
Invertebrate and vertebrate sea animals were created on Day Five of Creation Week.

Then God said, “Let the waters teem with swarms of living creatures, and let birds fly above the earth in the open expanse of the heavens.” And God created the great sea monsters and
every living creature that moves, with which the waters swarmed after their kind, and every winged bird after its kind; and God saw that it was good. And God blessed them, saying, “Be fruitful and multiply, and fill the waters in the seas, and let birds multiply on the earth.” There was evening and there was morning, a fifth day.

**Trilobites** are numerous in the fossil record. The word means *three lobes* and that is primarily how they are identified. Their variety seems almost limitless, and yet they are all classified as trilobites. The basic identifying characteristic is the body style – three lobes, with a few exceptions. Take a look at some of the types of trilobites you might find.
Corals are colony animals characterized by having polyps, which are essentially cylinders that have housed the internal organs of the individual animal. There are a huge variety of corals both extinct (not existing anymore) and extant (living today).